

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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| Applicant's or agent's file reference Case 22313 | FOR FURTHER ACTION See Form PCT/IPEA/416 | |
| International application No. PCT/EP2004/013007 | International filing date (day/month/year) 17.11.2004 | Priority date (day/month/year) 26.11.2003 |
| International Patent Classification (IPC) or national classification and IPC B01D29/62 | | |
| Applicant F. HOFFMANN-LA ROCHE AG | | |
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 2 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> | | |
| <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p> | | |
| Date of submission of the demand 20.05.2005 | Date of completion of this report 11.10.2005 | |
| Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016 | Authorized Officer Hilt, D Telephone No. +31 70 340-4259  | |

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/013007

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-10 as originally filed

Claims, Numbers

1-9 received on 11.07.2005 with letter of 07.07.2005

Drawings, Sheets

1/6-6/6 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/013007

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|-----|
| Novelty (N) | Yes: Claims | 1-9 |
| | No: Claims | |
| Inventive step (IS) | Yes: Claims | 1-9 |
| | No: Claims | |
| Industrial applicability (IA) | Yes: Claims | 1-9 |
| | No: Claims | |

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

1. The present application relates to a reactor for solid phase synthesis.

The closest prior art document D1 is:

D1: WO 94/00217 A (SHURDOV MIKHAIL ARKADIEVICH ;SOKOLOV
ANATOLY VASILIEVICH (RU)) 6 January 1994 (1994-01-06)

2. The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses (Abstract and figures) a filter device comprising:

- a vessel with a plurality of filter cartridges;
- air tubes which are located in the lower part of the filtering elements (4) along and very close to their lateral sides so that the bubbles coming out of the openings move along the surface of the filtering elements (4) and clean the latter.

The subject-matter of claim 1 therefore **differs from** this known filter device in that the filter comprises a filter cartridge which comprises an intermediate bottom separating the filter cartridge in a lower chamber connected to the filtrate outlet and an upper chamber; and a one-way valve connecting the upper chamber with the lower chamber such that the intermediate bottom is pervious in direction from the upper chamber to the lower chamber but not in direction from the lower chamber to the upper chamber.

The subject-matter of claim 1 **is therefore novel** (Article 33(2) PCT).

The problem to be solved by the present invention may therefore be regarded as to propose compact filter cartridges, which are able to deliver air to the bottom of a reactor for mixing the reactants and the solid phase in a solid phase synthesis when the filtration is stopped.

No hint can be found in the available prior art that would have led the skilled man to the filter element as disclosed in document D1 towards a filter element used in the reactor of the present invention.

The subject-matter of claim 1 is involves therefore an inventive step (Article 33(1,2,3) PCT).

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(SEPARATE SHEET)**

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3. Dependent apparatus claims 2-9

Claims 2-9 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

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Claims

1. Reactor (1; 1A) for solid phase synthesis comprising a vessel (2), a filter (3; 3A; 3B; 3C; 3D) arranged in the vessel (2) and a filtrate outlet (4) for evacuating the filtrate out of the filter, the filter being connected to the filtrate outlet (4), characterized in that it comprises means (3; 4; 3A; 3B; 3C; 3D) for delivering a gas into the vessel (2) in a region of the vessel (2) near to the bottom (24) of the vessel (2) and beside the filter (3; 3A; 3B; 3C; 3D) and further characterized in that the filter comprises a filter cartridge(3;3A; 3B; 3C; 3D) which comprises an intermediate bottom (32; 32D) separating the filter cartridge (3; 3A; 3B; 3C; 3D) in a lower chamber (31; 31D) connected to the filtrate outlet (4) and an upper chamber(30; 30D); and a one-way valve(33; 33D) connecting the upper chamber (30; 30D) with the lower chamber (31; 31D) such that the intermediate bottom (32; 32D) is pervious in direction from the upper chamber (30; 30D) to the lower chamber (31; 31D) but not in direction from the lower chamber (31; 31D) to the upper chamber (30; 30D).
2. Reactor (1; 1A) according to claim 1, characterized in that the filter cartridge (3; 3A; 3B; 3C; 3D) is a filter candle.
3. Reactor (1; 1A) according to claim 1 or 2, characterized in that the filtrate outlet (4) comprises a gas inlet (40; 40A) for delivering the gas into the vessel (2) through the lower chamber (31; 31D) of the filter cartridge (3; 3A; 3B; 3C; 3D).
4. Reactor (1; 1A) according to one of claims 1 to 3, characterized in that the vessel (2) comprises a plurality of filters (3; 3A; 3B; 3C; 3D).
5. Reactor (1; 1A) according to one of claims 1 to 4, characterized in that the vessel (2) comprises a double casing (20) for temperature regulation.
6. Reactor (1; 1A) according to one of claims 1 to 5, characterized in that the filter (3; 3A; 3B; 3C; 3D) or filters comprise a slotted screen filter medium.

7. Reactor (1; 1A) according to one of claims 1 to 6, characterized in that the vessel (2) comprises a filtrate inlet (21) connected to the filtrate outlet (4) such that the filtrate can return from the filtrate outlet (4) via the filtrate inlet (21) into the vessel (2).

8. Reactor (1; 1A) according to one of claims 1 to 7, characterized in that the vessel (2) comprises an exhaust (22; 22A) connected to the means (3; 4; 3A; 3B; 3C; 3D) for delivering the gas such that the exhausted gas can return back into the vessel (2).

9. Reactor (1; 1A) according to one of claims 1 to 8, characterized in that it comprises a cascade of vessels (2) each comprising an exhaust (22; 22A), which vessels (2) are connected together in such a way that the exhaust (22; 22A) of one vessel (2) is connected to the means (3; 4; 3A; 3B; 3C; 3D) for delivering the gas of the following vessel (2).